

# Development and Operation

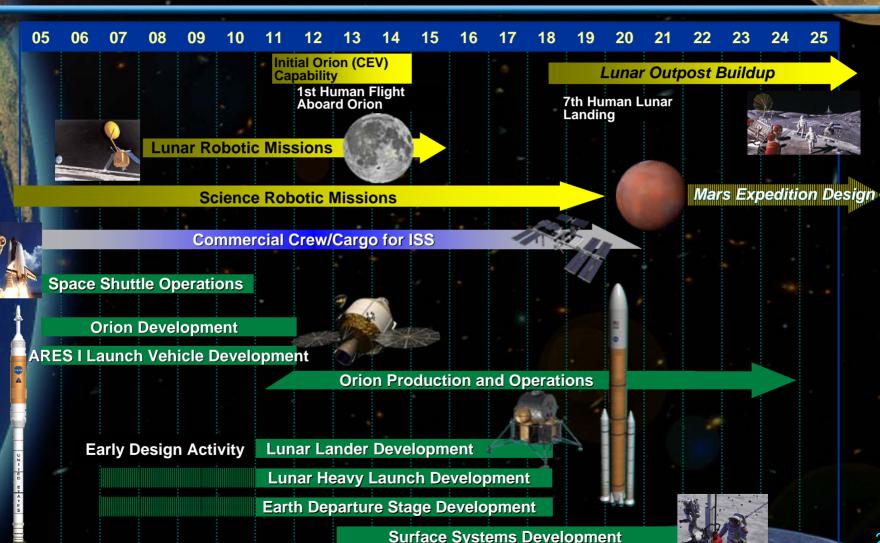
#### Scott "Doc" Horowitz

Associate Administrator

NASA Exploration Systems Mission Directorate

## **Exploration Roadmap**



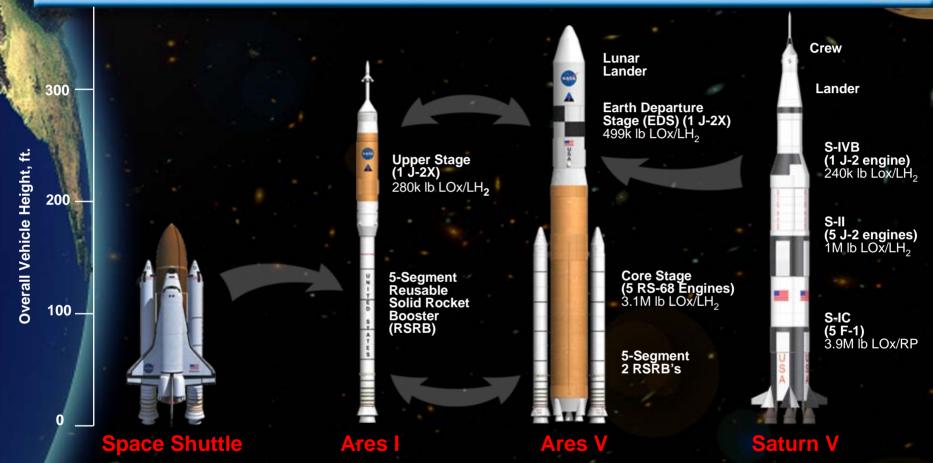


Note: Specific dates and milestones not yet established. CEV/CLV availability planned for as close to 2010 as possible, but NLT 2014 Return to the moon as early as 2018, but NLT 2020.

Implementing the Vivion

#### **Building on a Foundation of** Proven Technologies **Launch Vehicle Comparisons**





Height: 184.2 ft Gross Liftoff Mass: 4.5M lb Gross Liftoff Mass: 2.0M lb

> 55k lbm to LEO 48k lbm to LEO

Height: 321 ft

Height: 358 ft Gross Liftoff Mass: 7.3M lb

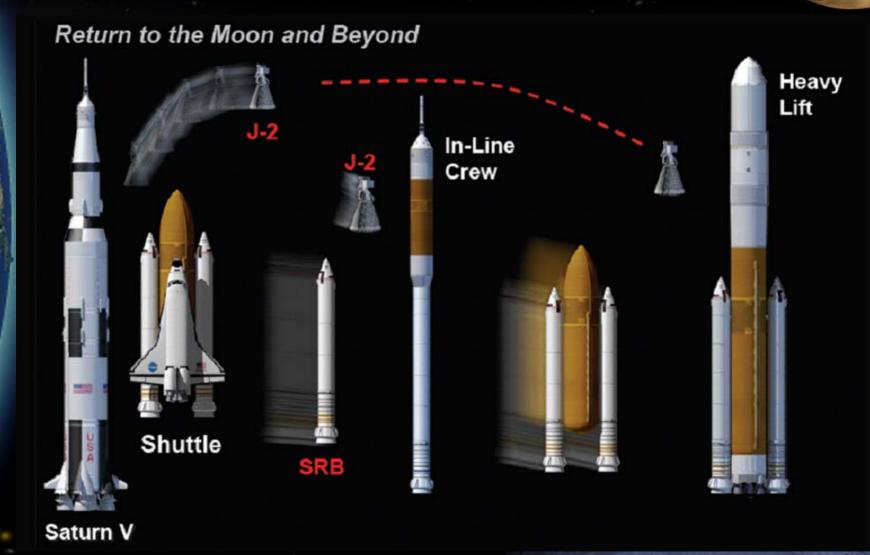
117k lbm to TLI 144k lbm to TLI in Dual-Launch Mode with Ares I 290k lbm to LEO

Height: 364 ft Gross Liftoff Mass: 6.5M lb

> 99k lbm to TLI 262k lbm to LEO

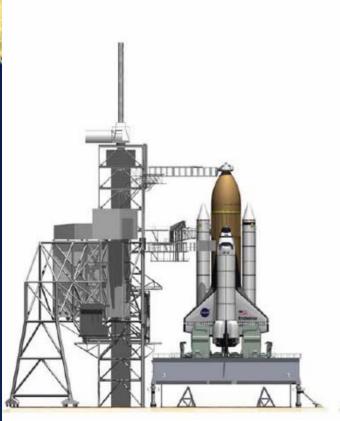
## Heritage Derived Launch Vehicles

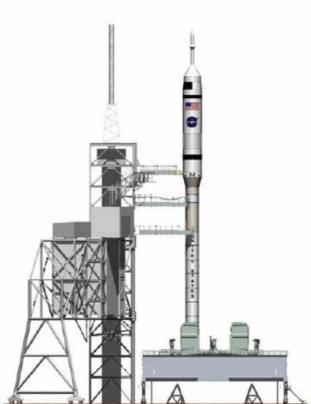




### **Launch Pad 39B Transition**









Shuttle at LC-39B (looking north) 1985 - 2006 ADFT-0 at LC-39B (looking north) 2009

CLV at LC-39B (looking west) 2011

## A1 Test Stand



